Report No RA/96/519S AU1-8002

PROGRESS WITH THE INTRODUCTION OF ROAD SAFETY AUDIT IN AUSTRALIA AND NEW ZEALAND

by

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Joint 18th ARRB Transport Research Conference and
Transit New Zealand Land Transport Symposium "Roads96"

Christchurch, September 1996

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SUMMARY

Road Safety Audit was introduced to New Zealand in 1992 In Australia it first appeared around 1990 in New South Wales and has been progressing in each state, with differing emphases

This paper concentrates on recent developments in Australia and New Zealand The implementation of safety audit of projects is described in each Australian State and New Zealand, on both state highways and in the local authority sector Generally safety auditing is well received, but barriers to its full realisation are considered Training is a key issue in both countries with demands for 'accreditation' of auditors

Some discussion on the future directions of safety audit is provided

Ian Appleton is the Safety Audit Manager in the Review and Audit Division of Transfund New Zealand He emigrated to New Zealand in 1980 working firstly in the Ministry of Transport Traffic Research Branch In 1985 he moved to Traffic Engineering where he was responsible for coordinating the Ministry of Transport s contribution to the national accident investigation programme In 1990 he was appointed to the position of Safety Audit Manager with Transit New Zealand He was responsible for developing Transit s Safety Audit Policy and Procedures He was a member of the Austroad's Road Safety Audit Steering Committee that developed the Austroad's Guide, and was a member of the ITE committee 4S-7 which produced the ITE Informational Report on Road Safety Audit At present he is developing and implementing procedures for the safety audit of the existing network

INTRODUCTION

1 Road Safety Audit has been the subject of a number of previous papers Appleton (1991) discussed the opportunities that existed for a pro-active road safety programme Jordan and Barton (1992) described what safety audit is and why it is needed Middleton (1994) described pro-active road safety programs in Queensland, including road safety audit Appleton and Jordan (1994) provided a progress report on the introduction of safety audit in Australia and New Zealand

2 AUSTROADS (1994) details road safety audit in its national guidelines Hereafter these guidelines are called the "Austroads Guide" The Institute of Transportation Engineers (1995) has published an 'Informational Report' on the subject

3 Appleton and Jordan (1994) described the introduction of safety audit in Australia and New Zealand essentially up to the end of 1993 This paper will concentrate on the continued implementation and development of safety audit during 1994 and 1995 The report is in three sections dealing with implementation, common themes and future directions The safety audit process is not described here Readers are referred to the Austroads Guide

IMPLEMENTATION OF SAFETY AUDIT IN AUSTRALASIA

AUSTRALIAN CAPITAL TERRITORIES (ACT)

4 The ACT started to consider road safety audits in 1994 and a training course was held in October 1994 ACT has not produced its own manual but has formally adopted the Austroads guide. Safety Audits are currently undertaken on large capital works programmes, that is works in excess of $1 million, at different stages but generally at the preliminary design stage Safety audits of existing roads have been undertaken but it will be some time before they become a matter of operational policy

NEW SOUTH WALES (NSW)

5 NSW Roads and Traffic Authority (RTA) started safety audits in July 1990 with an overview of the Pacific Highway Audits of plans and existing roads commenced formally in July 1991 with the release of their manual Their policy is to audit 20 projects and 20% of the existing road network annually Two day training courses have been held in conjunction with the Institute of Municipal Engineers (IMEA)

6 RTA published the revised edition of their manual in January 1995 It is designed to complement the Austroads Guide The Austroad Guide has not been adopted formally, but the RTA manual draws heavily on the Austroads Guide

7 Local Authorities are encouraged to use safety audit, but they are not required to do so The RTA safety audit workshops and road safety induction courses promote safety audit in the local authority sector

NORTHERN TERRITORIES

8 Road safety audit is implemented in line with the Austroads Guide Some of the Darwin urban arterials have been audited It is anticipated that audits will commence in a systematic manner during 1996

QUEENSLAND

9 Queensland Transport started promoting the concept of road safety audit in 1991 through seminars The Land Transport and Safety Division of Queensland Transport is responsible for developing and maintaining road safety policies and guidelines for road network safety These guidelines include those for safety audit Interim guidelines have been prepared for auditing the design stages of a road scheme as well as for existing roads The Austroad Guide has not been adopted formally

10 To date, training workshops on road safety audit have been conducted for District and local government personnel Although Districts have been encouraged to undertake road safety audit as part of their road safety programme, there is no formal requirement for them to undertake such work As such, road safety audit is not practised uniformly across the whole of Queensland Transport

11 Although many local authorities have shown strong interest in road safety audit, not many have put them into practice There is no requirement for them to do so

SOUTH AUSTRALIA

12 South Australia now has a formal course run by the University of South Australia which gives formal accreditation as a road safety auditor The course is based on the draft Austroads Course but is considerably more rigorous and requires virtually full time work for 3 weeks So far 29 auditors have passed the course and will receive accreditation certificates shortly

13 The Department of Transport has recently commenced formal road safety audits It is proposed that audits be undertaken on major routes in the urban and rural areas each year These audits will form the basis of improvement programmes for these roads The private sector auditors may undertake audits of local government roads in the future, though there has been little interest to date

14 At this stage formal procedures have not been documented or published Safety audits of new major projects will be undetaken as and when required and on smaller development projects It will be up to the discretion of the project manager as to the need for a safety audit

15 The Department of Transport are seeking to establish a South Australian College of safety auditors under the auspices of the Australian Institute of Traffic Planning and Management This should promote effective dissemination of learnings to all players Annual forums are proposed to discuss developments and findings and new cost effective

techniques for doing audits

16 A Road Safety Audit Database is proposed to store the results of all audits The database will enable safety problems which occur repeated to be identified, as well as areas where standards and/or procedures need changing Improvements to training courses are anticipated Research to develop more cost-effective remedial measures may eventuate The database will be able to monitor the safety audit process to ensure the correct procedures are being followed and whether audit recommendations are being adopted

TASMANIA

17 The Department of Roads and Transport started safety auditing in 1991/92 Training was initially through attendance at courses in Victoria More recently in-house training has been undertaken The state uses the Austroads Guide with some variations but has not formally adopted it All projects exceeding $500,000 are subjected to a safety audit In addition, projects of lesser value may be audited for specific reasons Local authorities are encouraged to undertake safety audits, but there is no requirement for them to do so

18 The safety audit process for existing roads is in place but is dependent on funds being available

VICTORIA

19 Informally safety audits commenced within VicRoads towards the end of 1989 and were confined to pre opening audits Formally, Safety Audits were introduced to VicRoads via a Corporate Management Group decision in December 1992 Training courses have been held regularly since then In VicRoads "Safety Audit" is called "Safety Review", the word "audit" will be used here for consistency with other sections

20 VicRoads has published its own safety audit manuals The first was published in April 1992 This was superseded by their "Road Safety Review Manual" published in January 1993 The degree to which the Austroads Guide is used varies across VicRoads Some use it formally, others use it very loosely

21 All projects with an estimated construction cost exceeding $5m are audited at all stages For projects costing less than $5m an audit is carried on a random selection of 20% of jobs At least 10% of maintenance works carried out in each region is audited

22 Local Authorities are encouraged to carry out safety audits but, at this stage, there is no requirement for them to do so

23 VicRoads undertake safety audits of existing roads Informally they are carried out as part of the maintenance programme Formally, VicRoads Regions are required to conduct safety audits on the worst 30% performing (in terms of road crashes) segments of the road network

WESTERN AUSTRALIA (WA)

24 Road Safety Audit in Western Australia started in late 1993 A Road Safety Audit Panel was formed to co-ordinate its introduction The Panel consists of representatives from local Government, The Institute of Municipal Engineers (IMEA), the RAC, the Main Roads Western Australia and consultants

25 Three day training courses are held by the Institute under the coordination of the panel

26 The Austroads Guide has been adopted by Main Roads and IMEA Main Roads has produced an Operational Guideline and a *Stage 5 Dual Use Path Audit Checklist* to augment the Austroads Guide

27 Main Roads policy is to audit 20% of the network and 20 new projects annually This policy applies to the metropolitan area A policy for rural areas is yet to be developed Local Authorities are encouraged to adopt safety audit Safety audit is a prerequisite for some of the funding submissions from local authorities These policies are subject to regular review

NEW ZEALAND

28 A series of workshops and pilot exercises using overseas practitioners were conducted to promote the safety audit concept in 1992/93

29 Transit New Zealand (1993) published its "Safety Audit Policy and Procedures" in 1993 For projects costing over $5m, the policy is applied at all four stages of audit For projects whose cost is in the range $100,000 to $5m, the policy is applied to the final design and pre-opening stages (3 & 4) Smaller projects may be audited at the asset manager's discretion

30 From July 1, 1993 the policy was made mandatory for a 20% sample of projects on state highways The projects were chosen to give a cross section of types of project, value of projects and stages of audit There is no requirement for local authorities to adopt safety audit but they are encouraged to do so A series of one day training courses introduced practitioners to the safety audit principles Now these elements have been included in a 5 day safety engineering training course which is organised by Transit New Zealand and presented by representative of all sectors

31 Transit New Zealand adopted the Austroads Guide in February 1995 as a guideline to compliment, not replace, the Transit New Zealand policy and procedures

32 During 1995/96 the same principles have been applied to the safety audit of existing roads First with a demonstration of techniques in use in NSW and Queensland, and then a series of pilot audits, draft procedures have been developed and published (Transit New Zealand 1996 a,b) These draft procedures are not mandatory, but are similar to the safety inspections being undertaken as part of the state highway safety management strategies

COMMON THEMES FOR DISCUSSION

33 The Austroads Guide recognise that, for road safety audit to be successfully implemented within the design process of an organisation, there are four fundamental requirements

- management commitment - support from the top is essential to create a safety philosophy in the organisation
- an auditor (or team) who is independent from the scheme design and who is experienced in accident investigation and remedial work (This raises the need for training courses for auditors)
- a set of checklists (the Austroads Guide contain a set of these)
- an agreed organisational process (decisions will normally be arrived at after consideration of available resources Austroads provide summaries of organisational requirements IHT (1990), Jordan and Barton (1992) and Austroads (1994) provide summaries of organisational arrangements)

TRAINING & ACCREDITATION

34 Training of professionals in the auditing process is vital if safety audit is to retain credibility as a powerful safety process At the moment such training lacks coordination nationally and is need of firm direction at a national level The training which is taking place is of a sound quality and practical level, but is being coordinated at state level by the state road controlling authorities, sometimes in conjunction with the IMEA Transit New Zealand has a road safety engineering course, and the Royal Melbourne Institute of Technology (with AUSTROADS funding) is finalising a course on road safety audit possibly for adoption nationally Short courses are occurring, but not in any coordinated way and they do not lead to any form of accreditation

35 The time is right for initiating a nationally accepted and accredited training course on road safety engineering Accreditation of safety auditors is a common concern, and some call for a register of accredited safety auditors The Austroads requirement of a 1 - 3 day training course plus at least one road safety audit is thought to be insufficient Consideration could be given to additional requirements such as the auditor should also have at least 5 years experience in road design and construction and a sound understanding of traffic engineering and management and should have participated in a number (as yet unspecified) of audits as a team member

36 In Western Australia, the Ministerial Taskforce on Traffic Calming recommended *"All Road Safety auditors to be accredited by the Institution of Engineers (Australia), or if no such protocol is established the WA Office of Road Safety to develop a suitable accreditation system "* The Institution of Engineers Australia would be best placed to compile a national register of accredited road safety auditors

LEGAL LIABILITY

37 Another concern at present, based on discussions locally, interstate and overseas is the question of legal liability There has been a view held by some engineers that by commissioning an audit report and then not acting on the report's recommendations, a highway authority will be opening the door to legal difficulties The AUSTROADS project recognised the shortage of useful information available to engineers on this sensitive topic, and the guidelines address this issue in a full chapter devoted to the topic, attempting to put into plain English an explanation for practising engineers The chapter emphasises the point that safety audit is not likely to increase an authorities exposure to litigation but rather will demonstrate to a court that the authority was concerned for public safety and was prepared to apply resources however limited, to that end 'Safety audit will create a safer road environment A major aim of litigation is to encourage safety, therefore the use of road safety audits will be encouraged by the legal system' (AUSTROADS 1994)

38 Internationally, road safety audit has become accepted in Britain, New Zealand and Australia, and is gaining support in several Western European nations It is understood that concerns about legal liability are proving to be a serious obstacle to safety audit being widely adopted in the United States It would be a tragedy for road safety if such an obstacle proved immovable in the United States or any other country

39 The issue of legal liability in New Zealand is of less significance than elsewhere because of the accident compensation scheme Under that scheme, personal injury claims are generally prohibited (being limited to claims for exemplary damages where it is claimed that a roading authority has behaved in an outrageous and reprehensible manner) In general any claim would be for damage to propert only

COSTS OF ROAD SAFETY AUDIT

40 The costs of road safety audit include

- The Audit costs (mainly the time of the audit team)
- Redesign Costs (if any)
- Any increased project costs

41 Project cost increases due to an audit are difficult to quantify Initial fears that road safety audit would recommend high cost treatments everywhere in its pursuit of safety, rather than seek realistic and safe options, appear not to have been sustained It is likely that auditors realise their own credibility is on the line in their reports, and they know that the decisions made for any scheme need to take costs into account An auditor's role is to ensure that deliberate decisions are made on the basis of carefully considered safety advice

42 Australian experience with audit costs is indicating that a design stage audit of a large scheme may cost some $3 - 4 000 per stage, and a small scheme may cost up to $1,000 per stage Some larger audits may cost up to $8 000 It appears that many consultants are keen to establish themselves as experienced auditors in what is seen as a growth area, and at present a wide variety of tender prices are often received in response to an advertisement

for an audit Whilst it can be argued that the 'market place' will eventually establish the 'going rate' for audits, there is a real concern amongst both asset managers and safety auditors at present that the lack of any form of accreditation for auditors may allow underpriced and underskilled people into the field where skill and judgement is paramount Should an audit team be selected on lowest price or by some other parameter?

43 The quality of the audits based on price is of concern The deficiencies can be overcome with specific instructions relating to team size, background, attendance at training courses, road and traffic engineering experience, management experience and audit methodology

44 In New Zealand, the costs of conducting the audits, in both fees and staff time, appeared to be about what was estimated Clearly, the fee for conducting the audit depends on the size and complexity of the project being audited The range of fees was approximately $1,000 to $8,500 with the majority falling in the range $3,000 to $5,000 The client's time in managing the audit is more difficult to estimate Estimates range from one to one and a half a person day per audit (Transit New Zealand (1994a))

DISSEMINATION OF RESULTS

45 One of the benefits of safety audit is the interaction between the auditors and the design team in which both sides learn from the experience Such learning is on a one to one basis The profession as a whole gains only slowly from each experience TNZ has commissioned two reviews The purpose of these reviews of audit findings is to spread the experience and learning gained from each audit more quickly to the profession, thereby maximising the benefits of safety audit

46 The two reviews are of audits of rural realignments and urban intersections (excluding roundabouts) As well as reviewing the findings, the reviewers made observations about the audit process and the audit reports At the time of writing, the reviews are undergoing a peer review prior to publication of the results

47 Rather than commission specific reviews of audit reports, it would be simpler, and more complete, to monitor all audits as part of the audit process A method which could be considered is to require information from all audits to be entered onto a national database Just how practical this is would need to be explored The experience of South Australia can act as a guide to other authorities considering this possibility

BENEFITS OF SAFETY AUDIT

48 The most frequently quoted benefits (TNZ 1993) of safety audit are to

- Minimise the risk and severity of accidents that may be created by the road project at the site and on the adjacent network,
- Minimise the need for remedial works after construction,
- Reduce the whole of life costs of the project,
- Improve the awareness of safe design practice

49 Many documents on Safety Audit allude to the benefits, but none are based on hard evidence AUSTROADS (1994) refers to a paper by Sabey (1993) who reported 'that the systematic application of road safety audit procedures across Britain has the potential to give a 3% saving in casualty costs' ITE (1995) quotes a paper by the Lothian Regional Council, Scotland (1991) which claims 'that one third of future crashes at road improvements are preventable by audit, and that a 1% crash saving per year is possible across the region '

50 There is a danger in the numbers gaining credibility through being quoted repeatedly

51 At the time of writing a research project is underway in New Zealand to explore the ways in which the benefits of safety audit might be assessed A fundamental problem is inherent in a prevention programme as opposed to a reduction programme The accidents which are saved are ones that will never happen A three phase research programme is nearing completion

- A scoping study in which possible methods are identified and described in general terms - there is no constraint on options at this stage,
- The more promising methods are developed further An overseas literature search is included here,
- One or two of the more promising methods are trailed

52 If the trials are successful, further research may follow In New Zealand, safety audit has been implemented as an act of faith, with considerable management commitment It is incumbent upon the promoters of the safety audit process to demonstrate that it is good value for money

SAFETY AUDIT OF EXISTING ROADS

53 The safety audit of existing roads is included in some manuals as the Stage 5 audit For example, Both the Roads and Traffic Authority (NSW) and VicRoads refer to the audit as a Network Review ' But in some authorities it has received less attention than the safety audit of projects

54 The focus of these audits is to determine whether the standards provided for road safety are appropriate and whether they are maintained in a good condition They are not to be confused with Accident Investigation Studies, which are a reaction to past crashes The audit of existing roads attempt to be proactive

55 These audits can be used at two levels One is to provide a general overview of an authorities performance in providing a safe road network, and the other is to provide detailed advice to asset managers on corrective action which the auditor believes need to be taken The emphasis of the audit is to provide a consistent environment

56 In New Zealand, TNZ has modified the NSW procedures and published its own draft procedures (Transit New Zealand 1996 a, 1996 b) The procedures were developed for rural

roads Further work is required to bring the procedures for urban roads up to the same level as those for rural roads

FUTURE DIRECTIONS

NATIONAL STRATEGIES

57 Although most states in Australia are undertaking road safety audits to some degree, there is no national "push" to do them apart from the publication of the Austroads Guide Road Safety Audit should be more highly promoted in national and state road safety strategies and action plans There was discussion a few years ago at national level in Australia that road safety audit should be linked to national funding of certain programmes However, this issue did not progress very far

TRAINING AND ACCREDITATION

58 For Road Safety Audit to be conducted successfully, they need to be carried out by trained and accredited "auditors" To this end, there needs to be a national accreditation programme and course

59 Mangement needs to be convinced that a proactive initiative such as road safety audit can produce good road safety savings The problem with this argument is that because of the scarcity of funds for road safety work, people tend to be reactive rather than proactive e g black spots will be treated before doing road safety audit

60 Training courses are held in every state and in New Zealand, but only the course in South Australia leads to accreditation The South Australia course is based on the draft curriculum developed for FORS and could be considered as a precursor for a national programme It is unlikely at present that New Zealand could join in that accreditation because the structure of national qualifications is different, being administered by the New Zealand Qualifications Authority

MONITORING AND EVALUATION

61 In order to convince management of the need and continued support for the proactive stance, current programmes do have to be monitored and evaluated Management needs the assurance that programmes are being implemented as intended Monitoring programmes can identify shortfalls in performance and propose improvements Transit New Zealand (1994a) reviewed the implementation of safety audit on state highways

62 However, evaluating the benefits of safety audit is a more difficult task To do this Transit New Zealand has let a contract to look at ways and means of trying to evaluate the benefits of safety audit Refer to paragraph 47 To date this work is in its early stages but there are some promising avenues which will be explored Only when the benefits, both quantitative in terms of reduction in crashes and qualitative in terms of increased awareness amongst professionals, have been demonstrated will safety audit

be adopted to the fullest extent

UPTAKE OF SAFETY AUDIT BY THE LOCAL AUTHORITY SECTOR

63 In Australian states and New Zealand, safety audit has been promoted in the local authority sector through workshops and training courses In New Zealand pilot exercises have been undertaken using local authority engineers to audit each others' projects (Transit New Zealand 1994b) However, with the exception of Western Australia where safety audit is a prerequisite for some of the funding submissions, there is no requirement for the local authority sector to adopt safety audit

64 It is thought that generally, the uptake of safety audit by local authorities is low If the profession believes that safety audit is beneficial, then why are local authorities not adopting it. In New Zealand, a survey of local authorities is underway to discover the extent to which safety audit is used and what are the barriers to its fuller acceptance

65 One option which only Western Australia has accepted, is to require local authorities to adopt safety audit

ACKNOWLEDGEMENTS

66 The author acknowledges the permission of the Chief Executive of Transfund New Zealand to present this paper The views expressed are not necessarily those of Transfund New Zealand, nor of the state road controlling authorities in Australia The author wishes to thank the following for their contribution to this paper· Franz Winkler (Main Roads, Western Australia), Dan Fardon and Paul Gelston (Department of Transport, South Australia), Michael Tziotis (VicRoads), David Johnson (Department of Transport, Tasmania), Tony Gill (ACT Department of Urban Services), Fred Schnerring (Roads and Traffic Authority, NSW), Gordon Lee (Queensland Transport), Dick McKeen (Department of Transport and Works Northern Territories)

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